



# **CITY OF KEENE & Biodiesel**

It all started six years ago with a small grant for the State of NH to offset the cost of B-20 biodiesel.

Since then the City has used over 200,000 gallons of B-20.

# What is biodiesel?

Biodiesel is a diesel fuel substitute.

Produced from Domestic Renewable Resources:  
any fat or oil, like vegetable oil, used greases, animal fat.

Meets health effect testing (CAA)

Lower emissions

High flash point (>300F), Safe

Biodegradable, Essentially non-toxic.

It is blended with petroleum Diesel at various levels  
up to a 20% level.



# BIODIESEL B-20 - THE REASONS:

- ➔ RUNS IN EXISTING, UNMODIFIED DIESEL ENGINES
- ➔ INTEGRATES WITH EXISTING FUELING INFRASTRUCTURE
- ➔ INCREASES LUBRICITY (very helpful now with USLD)
- ➔ CUTS EXHAUST EMISSIONS, ELIMINATES BLACK SMOKE AND ODOR – Just ask my mechanics!
- ➔ BURNS CLEANER THAN 100% DIESEL FUEL. (oil samples have proven this)
- ➔ BIODEGRADABLE
- ➔ RENEWABLE SOURCE OF ENERGY
- ➔ LOW-RISK SIMPLE TO PHASE IN AND OUT OF USE

# BIODIESEL IN KEENE- the facts

- ➔ Total diesel fleet using B-20.
- ➔ 68 vehicles and equipment.
- ➔ No problems have been reported.
- ➔ 200,000 gallons for the City have been burned since July 1,2001.
- ➔ This Equipment includes the Highway Department, Parks and Recreation and Emergency services.

- ➔ One of the many pieces of equipment burning Biodiesel



# Biodiesel – Keene NH

AND:

35,000 GVW chassis with a hook lift – It plows , it salts and it hauls dirt and pushes snow ! And even our new 2007 F450s are using it!



# Who else uses B-20 ?

- ⇒ PORT AUTHORITY OF NY/NJ Uses Biodiesel at LaGuardia airport , Newark Airport and JFK for all diesel operations.
- ⇒ Keene State College, City of Bangor, Maine and Mount Cranmore in Conway NH !

# Health benefits

- ⇒ Operators have stated that the headaches they would get from operating equipment with 100% diesel have gone away while operating equipment with B-20. In an air quality study done at the Keene transfer station the PM2.5 particulate matter was reduced by over 50% !
- ⇒ Why? You all have all ready heard.

# Biodiesel and Warranties!

- Most major engine companies have stated formally that the use of blends up to B20 will not void their parts and workmanship warranties. This includes blends below 20% biodiesel, such as the 2% biodiesel blends that are becoming more common. Several statements from the engine companies are available on the NBB website.
- All engine companies have already specified that the biodiesel must meet ASTM D-6751. Please make sure that the fuel purchased meets that standard. In addition the BQ-9000 certification for fuel distributors is very helpful in getting good quality fuel
- **Fuel quality and good fuel maintenance is important with any fuel. Pay attention to your petroleum product and there should be no issues with the biodiesel blends.**





## **How is Biodiesel in cold weather ?**

Keene has had many weeks of below zero temperatures and performance was not compromised. The key to good cold weather performance is to make sure that the Bio portion of the biodiesel is winter blended.

# Biodiesel and cold weather

- ➔ ***Biodiesel Antigels “Power Service” statement on biodiesel:***
- ➔ Biodiesel fuel is a type of diesel fuel made from soy or reprocessed vegetable and/or animal cooking oils. Biodiesel is typically blended with No. 2 diesel fuel in percentages ranging from 2 percent to a maximum of 20 percent. Biodiesel immediately and seamlessly transforms a diesel fleet into a cleaner-burning, alternatively fueled fleet without added investment in infrastructure. However, cold-weather operational problems have limited its use during winter months. Power Service Arctic Express Biodiesel Antigels eliminates the cold-weather operational problems associated with the use of diesel fuels containing up to 20 percent biodiesel (B20).

# Keene & Biodiesel

»The Day B-20 was put in  
the tank in the City we  
reduced our dependency  
on Foreign oil by  
20 Percent !!!!!!!



# **AND Biodiesel B-20**

⇒ IS THE RIGHT THING TO DO!

# BIODIESEL IN KEENE

- ➡ It is working and Keene has cleaner air because of it.
- ➡ Contact Info:  
srussell@  
ci.keene.nh.us



# Biodiesel -Keene NH

And:

- ➡ John Deere 644H Wheel loader.
- ➡ It moves a lot of salt and loads trucks and when it is not in the yard it is plowing parking lots!



# Biodiesel – Keene NH-It's use!

So what uses B-20 in Keene?

- ➔ 2004 Holder is running on B-20 and the operators like it!



# Biodiesel and the environment.

- ⇒ Are we really helping the environment?
- ⇒ Use of Biodiesel in the Cities 68 trucks and equipment means 417 tons of CO<sub>2</sub> is eliminated each year it is used.



# BIODIESEL RESEARCH (who else uses it)

- ⇒ STATE OF MICHIGAN After a year of testing the product use Biodiesel statewide.

# B-20 and its fuel characteristics

- ⇒ No loss of power
- ⇒ Increase in fuel mileage reports of 1 to 2 additional miles per gallon running B- 20
- ⇒ With proper fuel additive no problems with gelling reported.
- ⇒ Warranties are not voided despite all the rumors
- ⇒ Manufacturers warranty their parts and workmanship - not FUEL!

# Biodiesel- Keene NH

- ➡ As well as :
- ➡ The City of Keene's ladder truck
- ➡ It is busy keeping Keene safe.
- ➡ It uses B-20 and is very dependable! (except when being serviced as seen here)



# Diesel Engines and Air Quality

Diesel engines - MAJOR  
environmental and public  
health concern

- ⇒ Oxides of Nitrogen or NO<sub>x</sub>;
- ⇒ Fine particulate matter
- ⇒ A complex mixture of **volatile chemicals**  
(carcinogens or respiratory  
damaging agents)

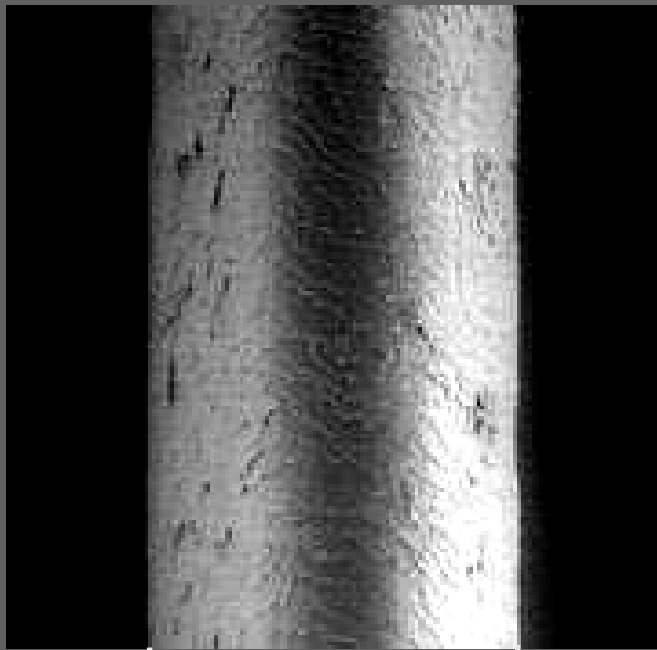


Downtown LA, 4/29/2004

Source: MSNBCmedia.msn.com

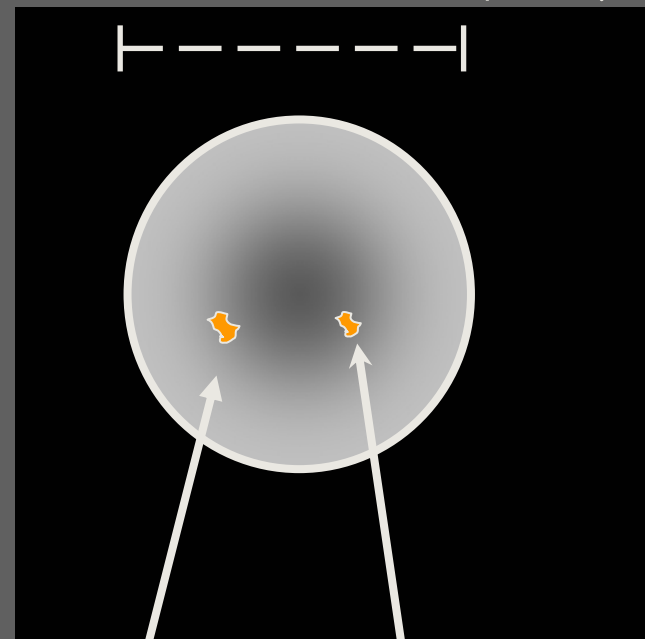
# What are Fine Particles?

A complex mixture of extremely small solid particles and drops of liquid in the air



Human Hair (45 - 130  $\mu\text{m}$  diameter)

Hair cross section ( $\sim 70 \mu\text{m}$ )



PM<sub>4</sub>  
(4  $\mu\text{m}$ )

PM<sub>2.5</sub>  
(2.5  $\mu\text{m}$ )

4-WD Forklift

8 Hour



PM<sub>2.5</sub>



EL/OC  
Resp. Cyclone

July 2, 2002  
KSC-Pilot

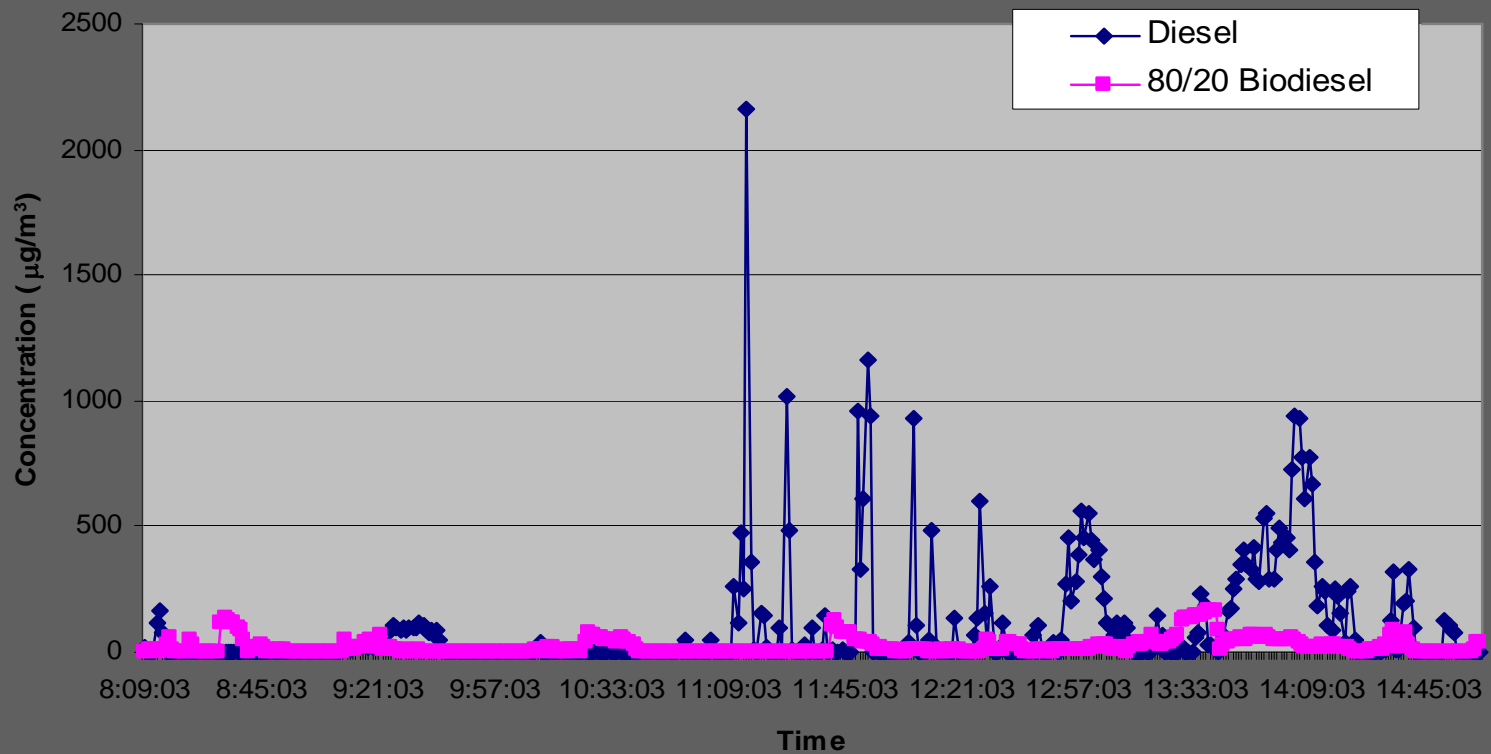
# And the question is: Can you burn B-100 ?

Just ask Keene State College and their answer is a resounding YES!. In warm weather they use B-100 in all their equipment on campus. Best thing they ever have done for CLEAN AIR!



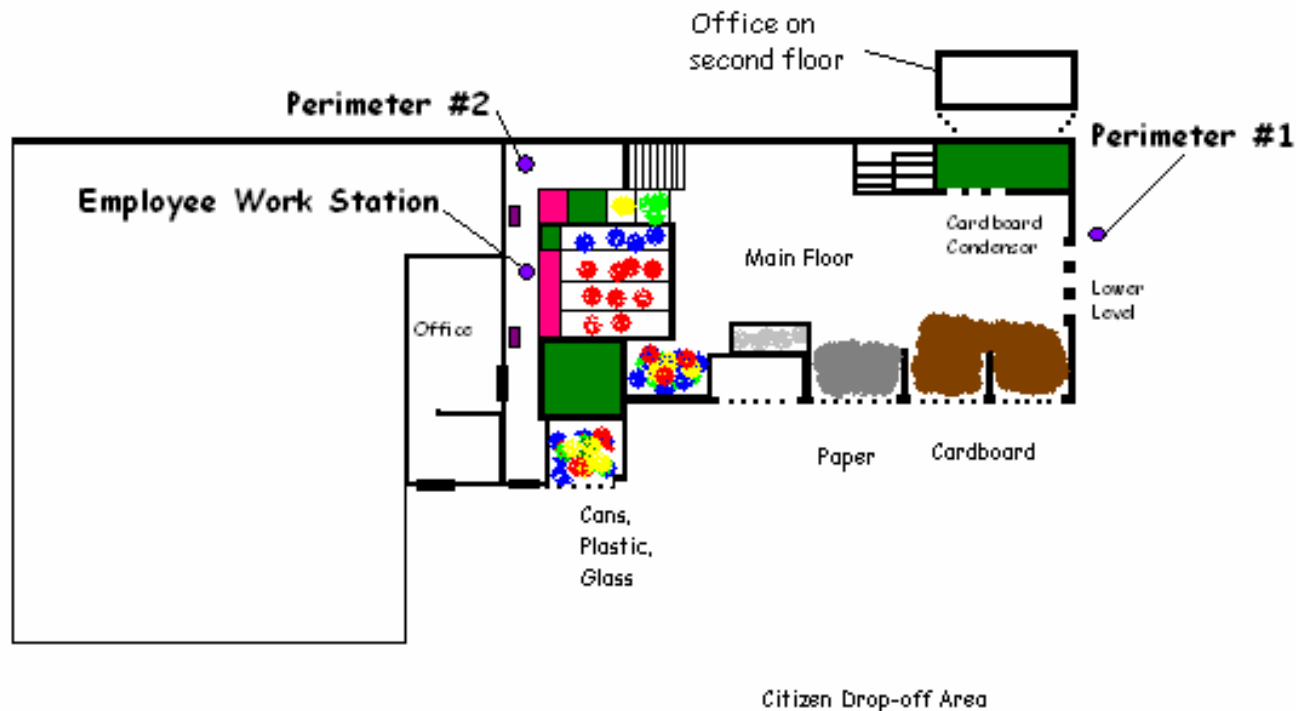
# Health effects-Study at Keene RC

Perimeter #1, PM<sub>2.5</sub> Concentrations, Keene Recycling Center





# City of Keene Recycling Center



**MUNICIPAL FACILITY**